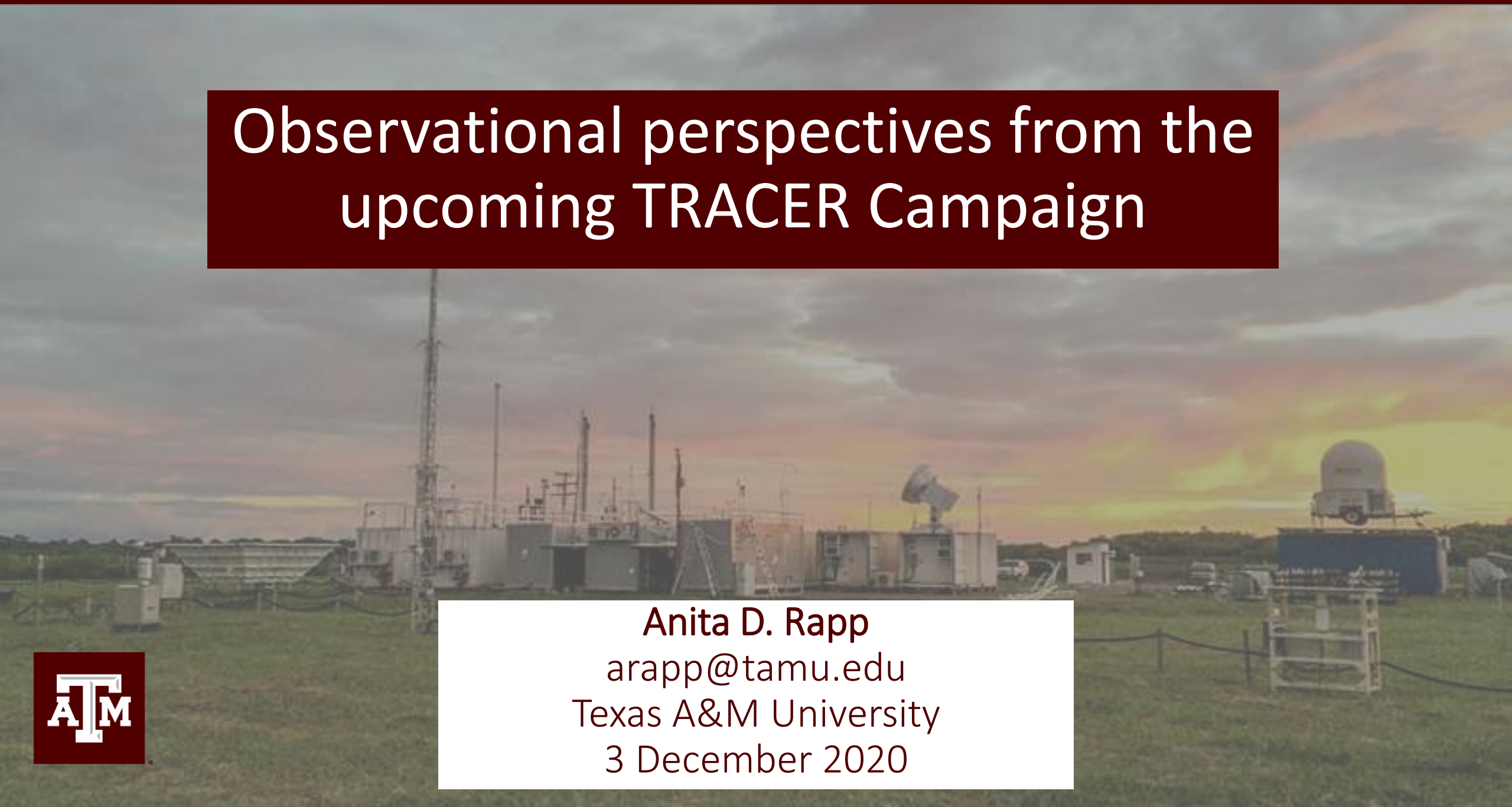
Observational perspectives from the upcoming TRACER Campaign



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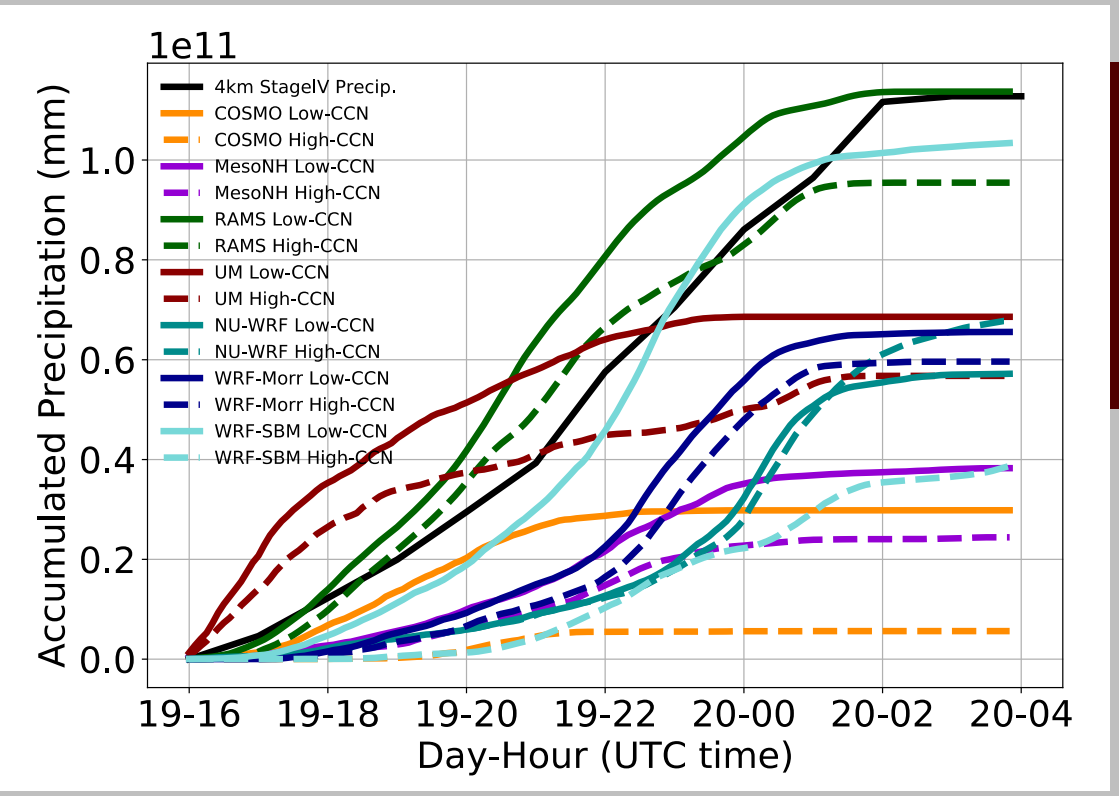
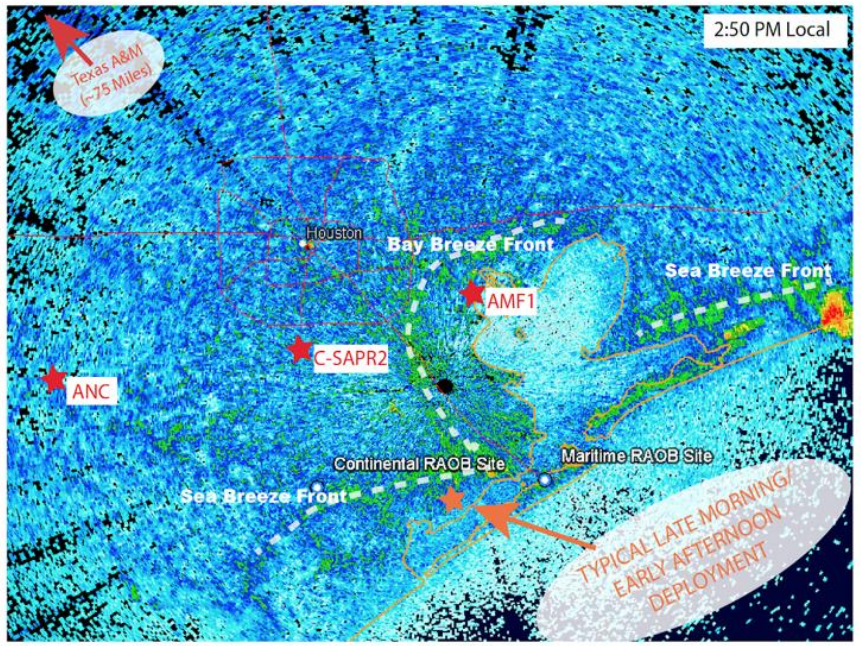
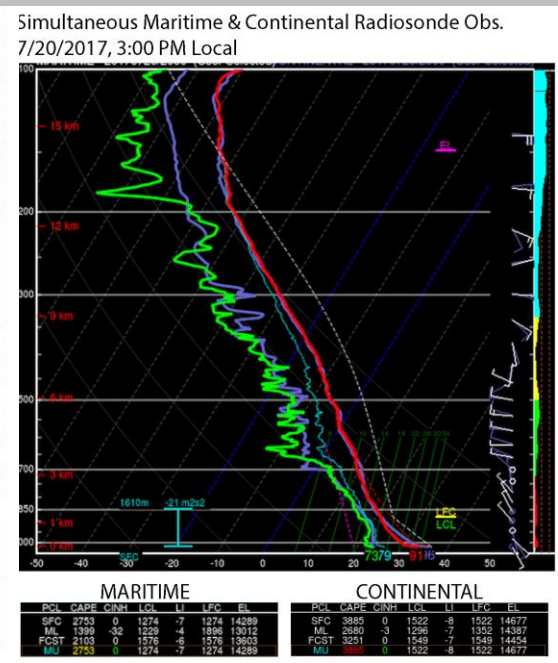
3 December 2020



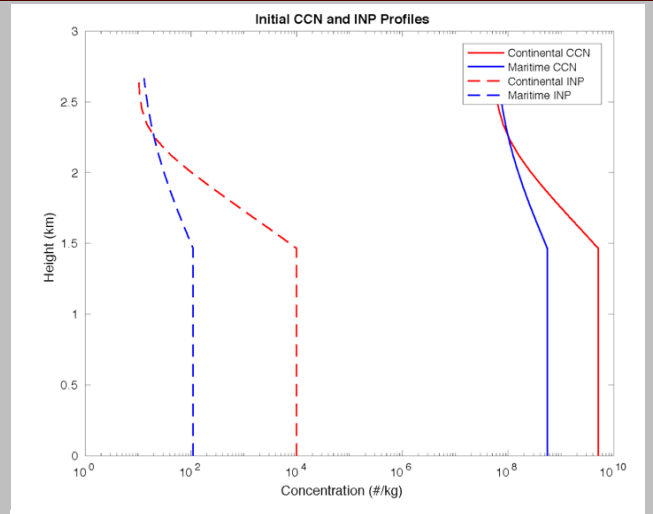
ACPC pilot study (van den Heever 2019, 2020)

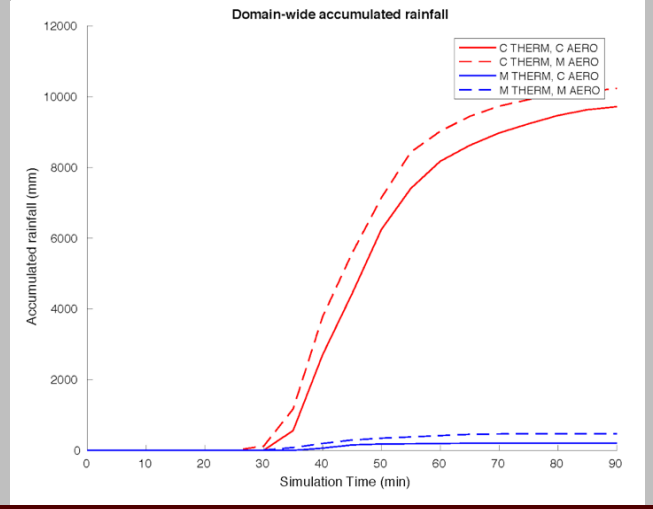
- Large model uncertainties in accumulated precipitation due to model physics representations
- Magnitude and sign of aerosol-precipitation interactions is different among models

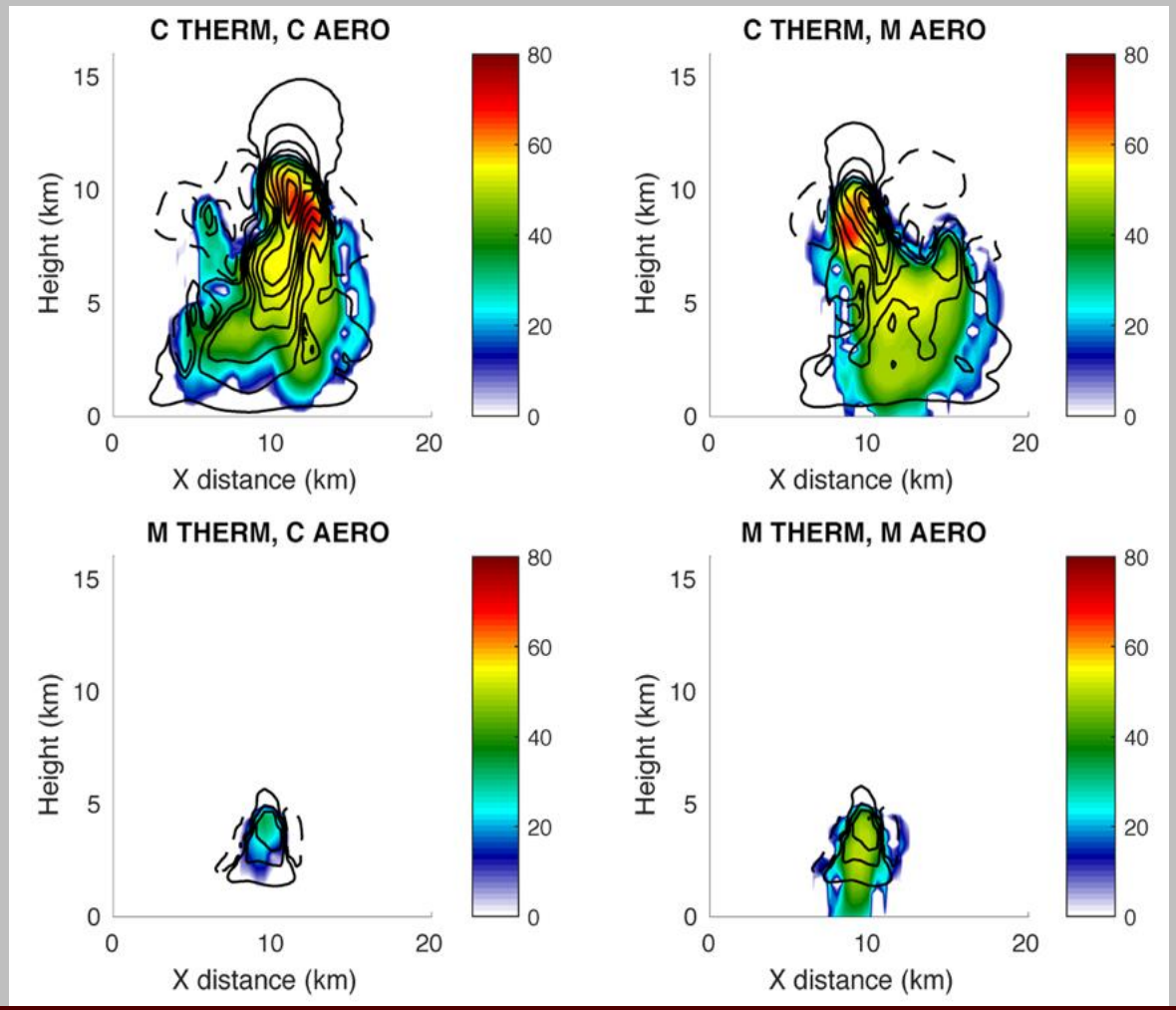




Thermodynamic, kinematic and, aerosol environments are highly variable in space and time across urban coastal regions

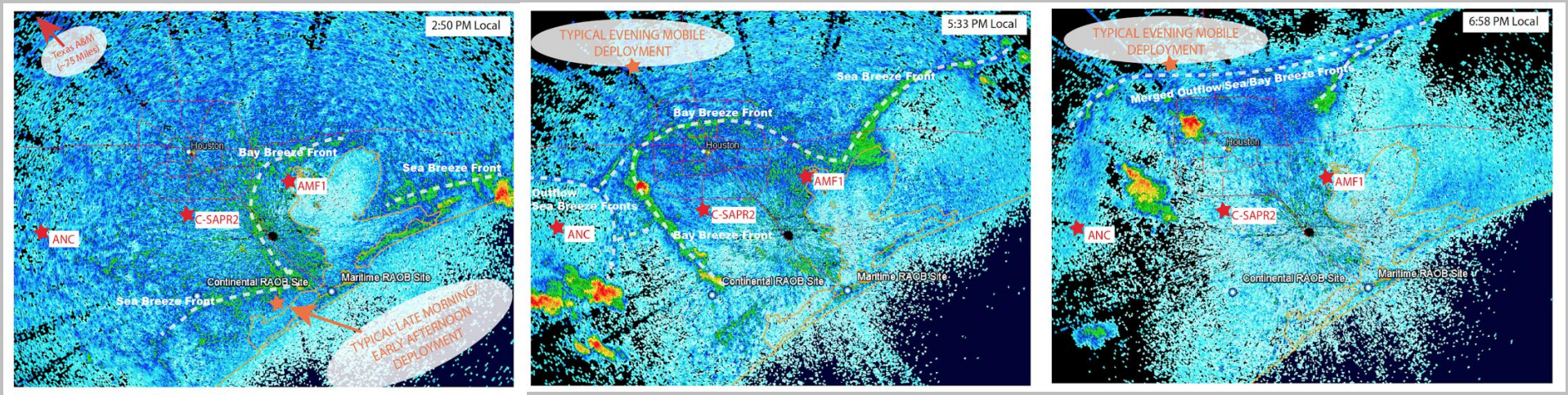






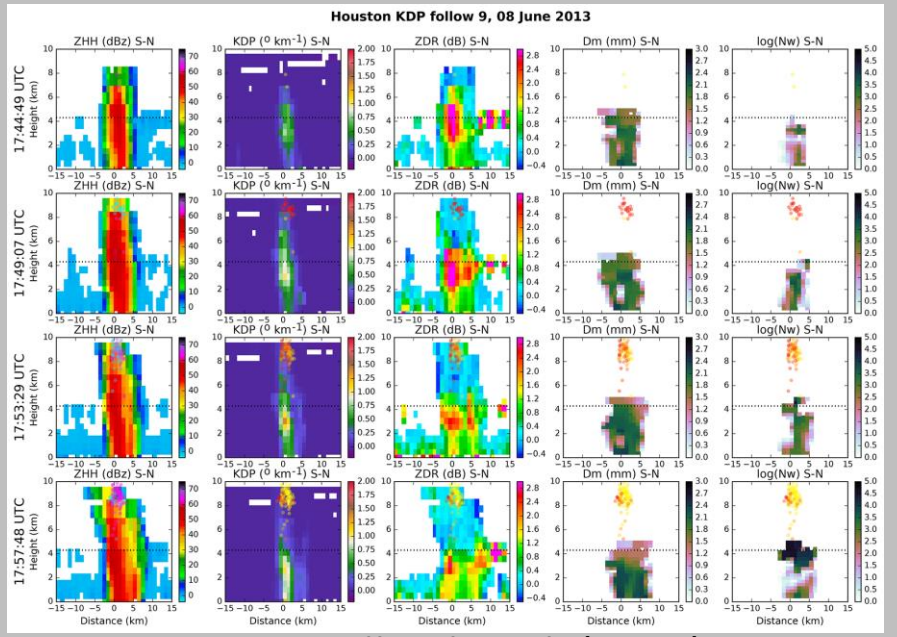
- Precipitation is highly sensitive to environmental differences across airmass boundaries
  - Meteorological and aerosol environments often co-vary
- Coupled convective dynamical and microphysical processes still highly uncertain contributing to large uncertainties in precipitation

→ *Observation strategies needed to target known uncertainties in process-level understanding of updraft kinematics, microphysics, their interactions, and environmental controls that impact precipitation*



DOE-ARM TRACER campaign is aimed at collecting the necessary high spatial and temporal resolution observations across a broad range of environmental and aerosol regimes to:

- Characterize and link convective kinematic and microphysical life cycles
- Understand environmental thermodynamic and kinematic controls on convective life cycle properties
- Isolate and quantify aerosol-convection interactions



From Fridland et al. (2019)